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Operating Instructions

IP-Netzwerktechnik

8186/31
WLAN access point, flush-mounted

Software version 1.0.0.3

BUSCH-JAEGER

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1 Safety

Warning

Electric voltage!
Risk of death and fire due to electrical voltage of 230 V.
– Work on the 230V supply system may only be performed by authorised electricians!
– Disconnect the mains power supply prior to installation and/or disassembly!

2 Intended use

This device has three operating modes.
It can be used either as access point for wireless communicating devices or as repeater to increase the transmission range in the WLAN network.
In addition, it can be connected as WLAN adapter via Ethernet to devices which do not have their own WLAN connection.
To set up the device requires an external device, e.g. a laptop.
The device must only be installed in dry indoor rooms.

3 Environment

Consider the protection of the environment!
Used electric and electronic devices must not be disposed of with domestic waste.
– The device contains valuable raw materials which can be recycled. Therefore, dispose of the device at the appropriate collecting depot.

All packaging materials and devices bear the markings and test seals for proper disposal. Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.
The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance.
(EU Directive 2002/96/EC WEEE and 2002/95/EC RoHS)
(EU REACH ordinance and law for the implementation of the ordinance (EC) No.1907/2006)

4 Technical data and settings

4.1 Technical data

General	
Types of functions:	Access point, Access point (WDS/Repeater), Client (WDS), Client (Relayd)
Mechanical characteristics	
Dimensions (L x W x H):	80 x 80 x 50 mm For mounting in commercially available deep flush-mounted, surface-mounted and hollow-wall sockets.
Weight:	112 g
Protection type:	IP 20
Temperature range during operation:	-5 … 45°C
Connections:	RJ 45 (10 / 100 Mbit/s) Screw contacts The data rate for all connections is 10 / 100 Mbit/s
Electrical characteristics	
Power supply:	100 ... 240 V AC, 50 ... 60 Hz
Power consumption:	≤ 1.8 W
WLAN characteristics	
Radio range:	2.4 GHz
Radio data rates:	Maximum 150 Mbit/s
Radio standard:	IEEE 802.11 b / g / n
Security and encryption:	WEP, WPA, WPA2

4.2 Factory settings

	Condition at delivery	Own settings
System/Administration:		
Password	admin	
System/System:		
Hostname	BJE-WLAN surface mounted	
UDP port	None	
Network/LAN/Settings:		
Protocol	Static address	
IPv4 address	192.168.55.1	
IPv4 netmask	255.255.0.0	
IPv4 gateway	None	
DNS Server	None	
Network/WLAN/Settings:		
The WLAN network is activated	Yes	
Channel	Auto	
Transmitting power:	100 %	
ESSID	BJE WLAN surface-mounted	
Mode	Access point	
Hide ESSID	No	
Network/Extended settings:		
Mode	Auto	
HT mode	20 MHz	
Network/WLAN/WLAN encryption:		
Encryption	WPA-PSK/WPA2-PSK Mixed Mode	
Cipher	Auto	
Key	PleaseChange	
Network/Diagnostics:		
Ping	None	
Notes		

5 Information about licenses

Parts of the firmware are subject to the GNU General Public License.

License Information
This product includes software of third-party suppliers subject to the terms of licence of the GNU General Public License. You may change or distribute this free software subject to the terms of the GNU General Public License.

Availability of the source code
Upon request we will send you the entire source code of the software licenced under the GNU General Public License - including all scripts, to control the compilation and installation of the drivers. You can also download it from the e-catalogue (www.busch-jaeger-katalog.de).

6 Setup and function

6.1 General description

The flush-mounted WLAN access point offers an excellent alternative for meeting the demands made on modern infrastructures according to DIN 18015-2 and RAL-RG 678, without having to go without the convenient use of modern, mobile technology such as tablet PCs or laptops and without limiting the transmission data rates. Additionally, the flush-mounted WLAN access point functions like a normal data socket with an RJ45 output for a conventional data terminal device (data rate up to 100 Mbit/s). The power is supplied direct via 230 V at the rear of the device.
The flush-mounted WLAN access point can be connected to the internal data network via a classic network cable. The transmission range of the WLAN can be adapted and limited to the conditions of the room. This creates high-performance radio cells in the room, which ensure a maximum radio band width within the room while operating at minimal power consumption and radiation.
Due to the minimum requirement for energy and resultant minimum radio emission, demarcation problems under individual access points and overcoupling of WLAN areas and reduction of data rates are largely avoided.

6.2 Types of functions

6.2.1 Single mode access point

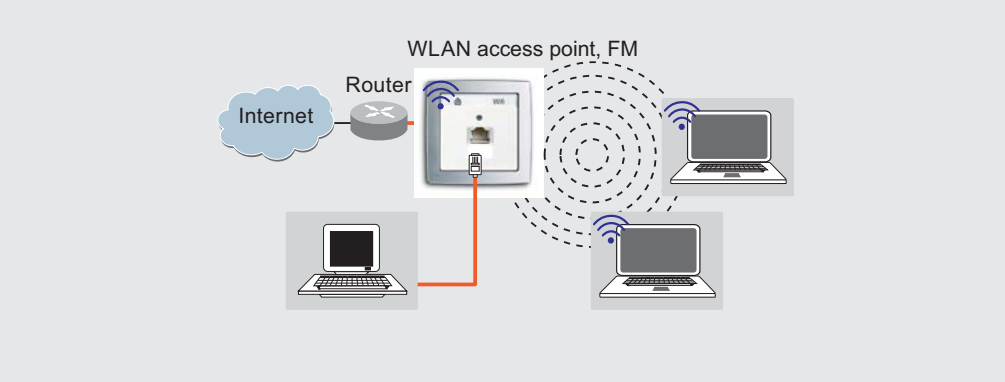

Fig. 1:

Internet coupling of terminal devices in the house via WLAN and RJ45 socket

- Hard-wired network coupling
- Interface to the LAN/Internet

Mode	Access point
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection
Channel	1-13

6.2.2 Access point for extending an installation around WLAN

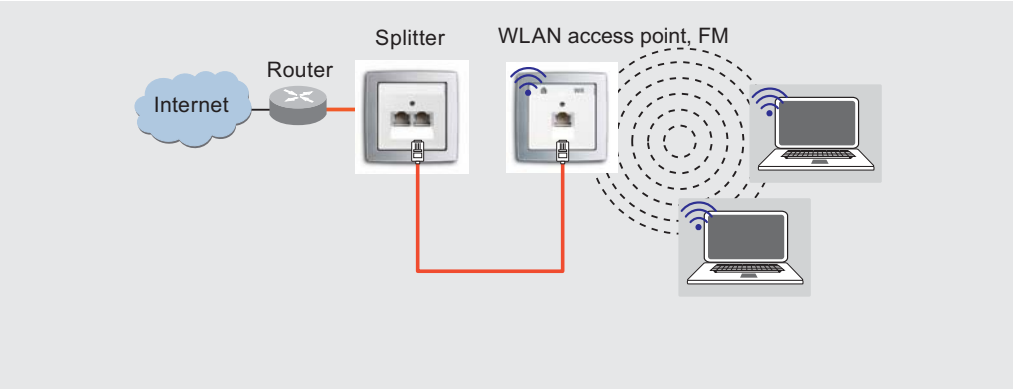

Fig. 2:

Internet coupling of terminal devices via WLAN for use in an existing installation with patch cable.

Mode	Access point
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection
Channel	1-13

6.2.3 Operation with several access points

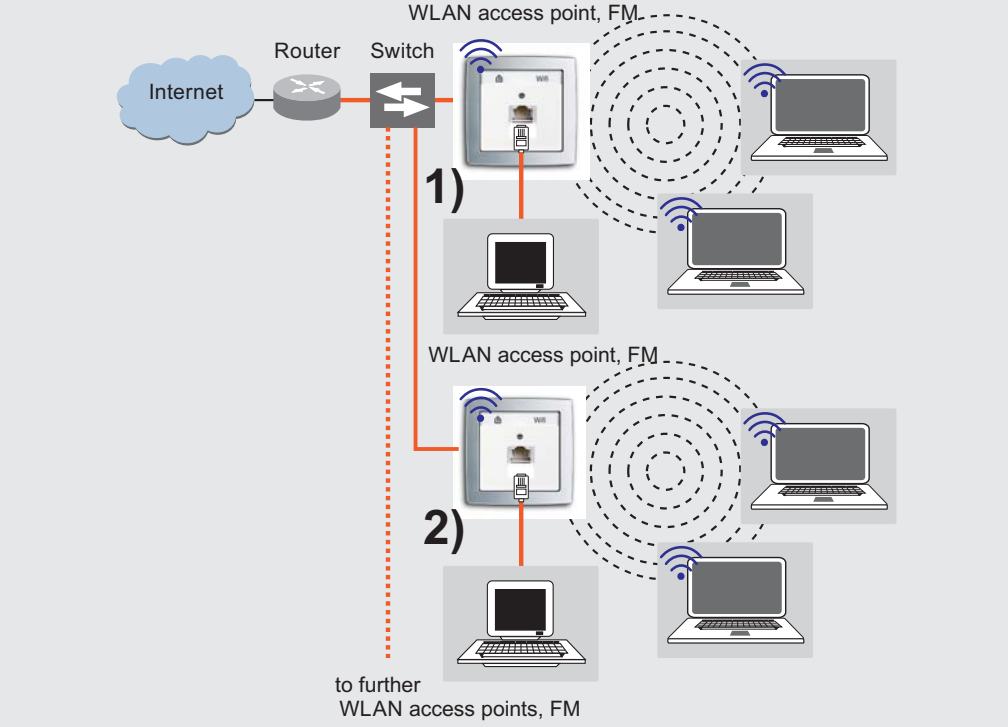

Fig. 3:

Operation of several flush-mounted WLAN access points via a switch

- Hard-wired network coupling
- Interface to the LAN/Internet

(1)

Mode	Access point
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection
Channel	1-13

(2)

Mode	Access point
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection or roaming
Channel	1-13

6.2.4 Increase in the range of WLAN (with WDS)

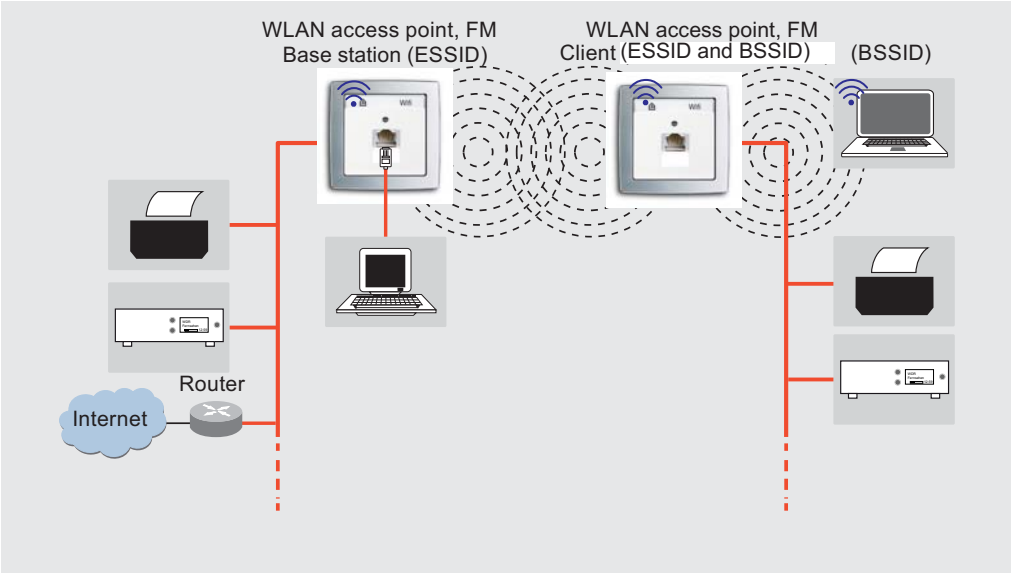

Fig. 4:

Connection of two network segments via WLAN

- Increase in the range of WLAN-capable devices
- Interface to the LAN/Internet

Base station:

Mode	Access point (WDS/Repeater)
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection
Channel	1-13

Client: Network interface 1

Mode	Client (WDS)
SSID	From the base station
Ip	192.168.x.y
Encryption	From the base station
Channel	From the base station

Network Interface 2

Mode	Access point
SSID	Free selection or roaming
Ip	Automatic
Encryption	Free selection or roaming
Channel	Automatic

- The base station and client must have the same SSID.
- The IP address must be located in the same area, e.g. 192.168.0.x.
- The encryption must be the same.

- The MAC address of the base station must be entered in the client in field BSSID.

Note

Both devices must be either a flush-mounted WLAN access point, or support the WDS standard.

6.2.5 Increase in the range of WLAN (without WDS)

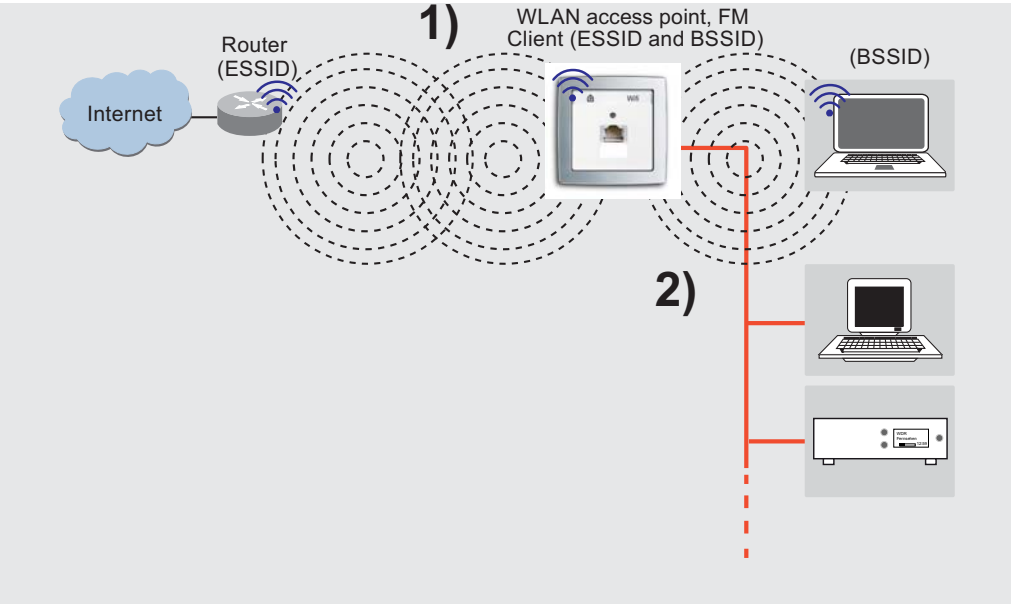

Fig. 5:

Coupling of terminal devices to a WLAN router

- Increase in the range of WLAN-capable devices
- Interface to the LAN/Internet

1) Router:

Mode	Access point
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection
Channel	1-13

2) Client: Network interface 1

Mode	Client (Relayd)
SSID	From the base station
Ip	192.168.x.y
Encryption	From the base station
Channel	From the base station

Network Interface 2

Mode	Access point
SSID	Free selection or roaming
Ip	192.168.x.y
Encryption	Free selection or roaming
Channel	Automatic

- The base station and client must have the same SSID.
- The IP address must be located in the same area, e.g. 192.168.0.x.
- The encryption must be the same.

- The MAC address of the base station must be entered in the client in field BSSID.

Note

This type of function can be used for different devices or when the WDS standard is not supported by the router.

6.2.6 Operation with several access points as separate WLAN networks

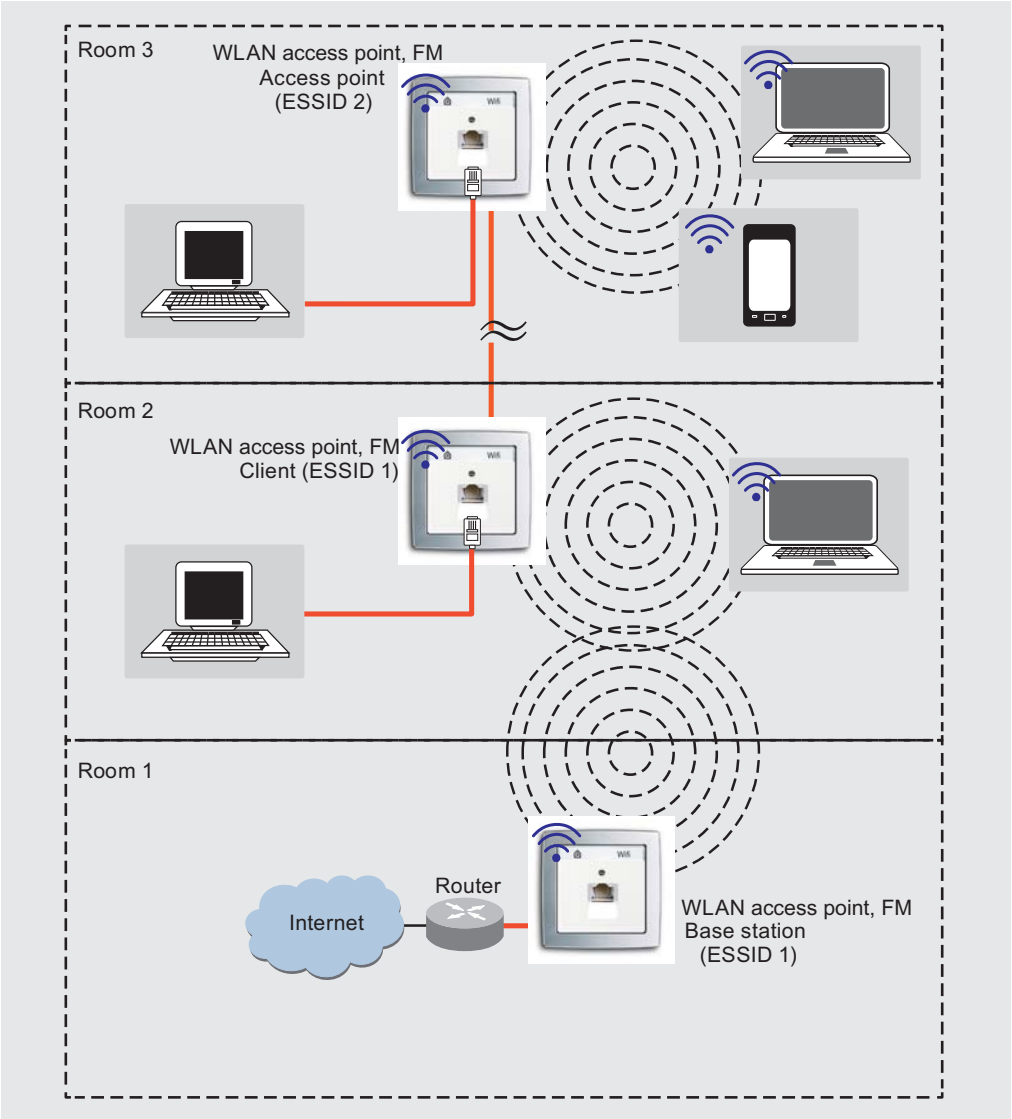

Fig. 6:

Inter-room use of the Internet via WLAN

- Interface to the LAN/Internet
- The same SSID for client and base station (room 1 and 2)
- Other SSID for room 3
- The same encryption for all rooms
- The same area for IP address for client and base station (room 1 and 2)

Room 3:

Mode	Only access point is possible

Room 2:

Mode	Client (WDS) with virtual access point (see also chapter 6.2.4)

Room 1:

Mode	Access point (WDS)
SSID	Free selection
Ip	192.168.x.x
Encryption	Free selection
Channel	1-13

6.3 Range of transmitting power

The range of transmitting power is, among others, dependent on the buildings infrastructure. Adjust the location for the flush-mounted access point to the spatial conditions.
As an example for concrete walls, the graphics show the received power in dependence of the transmitting power and the distance to the flush-mounted WLAN access point.

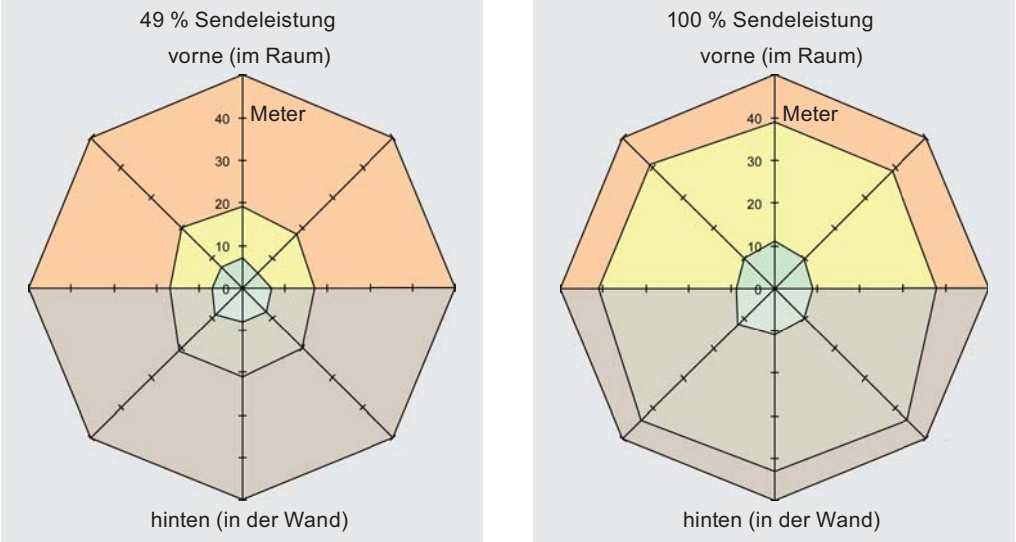

Fig. 7:

Legend	
	> –70 dBm Reception possible
	–60 to –70 dBm Good to medium reception
	0 to –60 dBm Very good to excellent reception

7 Installation and electrical connection

Warning

Electric voltage!
Risk of death due to electrical voltage of 230 V during short-circuit in the low-voltage line.
– Low-voltage and 230 V lines must not be installed together in a flush-mounted socket!

7.1 Requirements for the electrician

Warning

Electric voltage!
Install the device only if you have the necessary electrical engineering knowledge and experience.
- Incorrect installation endangers your life and that of the user of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:
- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
  1. Disconnect from power;
  2. Secure against being re-connected;
  3. Ensure there is no voltage;
  4. Connect to earth and short-circuit;
  5. Cover or barricade adjacent live parts.
- Use suitable personal protective clothing.
- Use only suitable tools and measuring devices.
- Check the supply network type (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

7.2 Mounting

The device must only be installed in commercially available deep flush-mounted and surface-mounted wall boxes.

7.3 Electrical connection

7.3.1 Connecting mains power

Warning

Electric voltage!
Risk of death due to electrical voltage.
First disconnect the mains power before starting any installation work!

Caution

Work on the supply system must only be performed by authorised and qualified electricians!

Connecting the mains power.

- To avoid influencing the network, disconnect the power supply of active components as well as data transmission devices (PC, etc) from those of other consumers (e.g. radio).
- Use line circuit breakers or protectors and, if necessary, independent overvoltage protection (C-arrester).

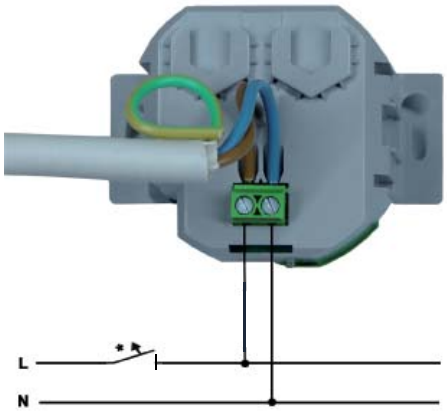

Fig. 8: Connecting the mains power

* Line circuit breakers or protectors.

7.3.2 Connecting the network cable

1. Pull the cable into the flush-mounted wall box from the top.
   - Use only device connecting boxes!
2. Shorten the cable so that it projects 90 mm into the box.
3. Strip approx. 80 mm of the cable.
4. Insert the flush-mounted WLAN access point into the box.

5. Pull off the 5-pole screw terminal box.
   – Attach the wires according to the colour code.

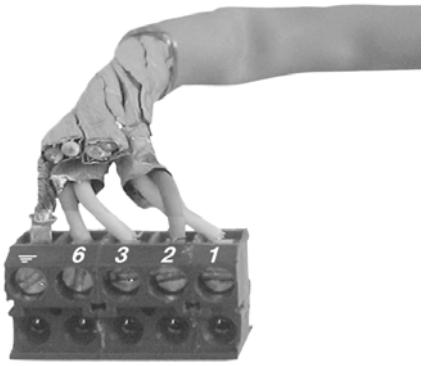

Fig. 9: Screw terminal box

Terminals	⏚	Screen
	6	Orange
	3	White
	2	green
	1	White

Colour code					
Terminal	⏚	6	3	2	1
Assignment	S				

Fig. 10: Colour code

Observe the following points:
- Maintain the pairs screen and the twist of the pairs as long as possible.
– Twist the entire screen.
– If necessary, use a 1 mm wire end sleeve.
- Adhere to the assignment in the patch bay and on the box.

6. Attach the terminal block to the screw terminal.
7. Check the installation by means of the LEDs (see chapter "Meaning of the LEDs" on page 39) and install the cover.

The device is now ready for operation with the factory settings.

8 Commissioning

8.1 Initial connection

We recommend that you establish the initial connection to the flush-mounted WLAN access point via the RJ45 socket.

- **Connection via the RJ45 socket**

To establish the connection via the RJ45 socket, connect your PC to the flush-mounted WLAN access point via a network cable.

Make the following TCP/IP settings on the network adapter of the configuration PC (or tablet computers or Smartphones):
TCP/IP-Einstellungen vor:
– Use the static IP address, e.g. 192.168.55.x, here x must be between 2 and 255.
- Subnet mask 255.255.0.0
The flush-mounted WLAN access point can now be reached with a Web browser via address http://192.168.55.1.

- **Connection via WLAN**

To establish the connection via WLAN, select the network with the SSID "BJE WLAN AP". The WPA2 key is "PleaseChange"; we recommend changing this as soon as possible (see chapter "Interface configuration – WLAN encryption" on page 34).

Make the following TCP/IP settings on the network adapter of the configuration PC (or tablet computers or Smartphones):
– Use the static IP address, e.g. 192.168.55.x, here x must be between 2 and 255.
- Subnet mask 255.255.0.0
The flush-mounted WLAN access point can now be reached with a Web browser via address http://192.168.55.1.

- **Configuration via backward LAN interface**

If you wish to configure the flush-mounted WLAN access point via the backward LAN interface, the the subnet mask 255.255.0.0 must be set on the router and on the configuration PC.

The flush-mounted WLAN access point can now be reached in your network via address http://192.168.55.1.

8.2 Configuration

8.2.1 General

You can configure the flush-mounted WLAN access point via the Web interface and adjust it to your requirements.

Aside from the change of password (see chapter "Password setting" on page 23), also the key in the interface configuration of the WLAN network (see chapter "Network – WLAN settings – Device configuration - General settings" on page 31) should be changed.
Additionally, you should carry out an adjustment to your network and enter the gateway and the DNS server of your router for access to the Internet (see chapter "Network IP settings" on page 27.

Note

Please note that before exiting an application page the changed settings must be saved via button "Save & apply". Otherwise the changes will not be taken over by the flush-mounted WLAN access point.
After making changes to the settings of the IP address, to the SSID or the WLAN encryption, the connection between the PC and the flush-mounted WLAN access point may be cut and must be reestablished by the PC.

8.2.2 Logon

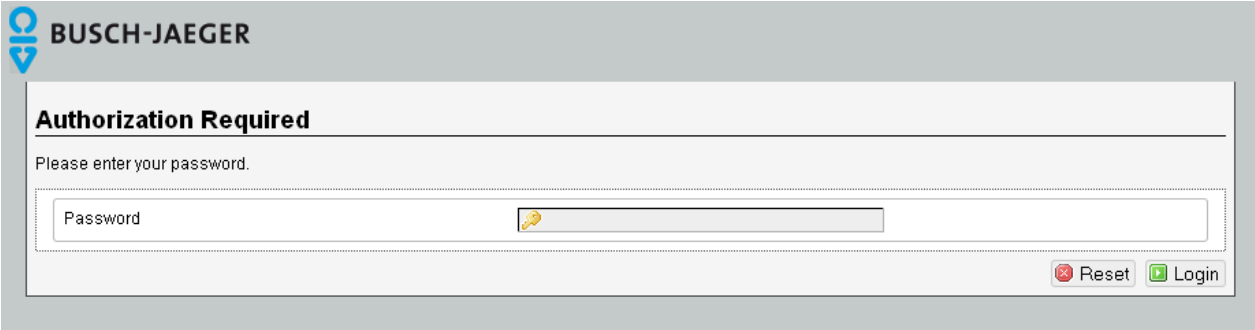

Fig. 11:

Enter the password ("admin" at the point of delivery) and log yourself in.

8.2.3 Password setting

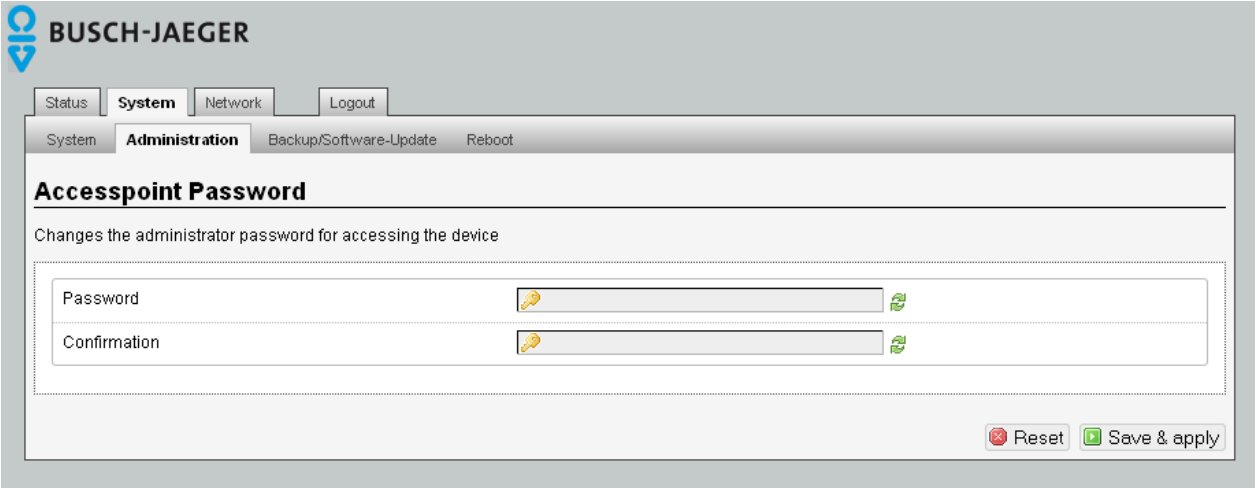

Fig. 12:

Via menu "System/Administration" you reach the password setting of the flush-mounted WLAN access point. Raise the access protection by setting an individual password. You can make the password visible by clicking the green arrows.
Confirm the password and save it under "Save and apply".

8.3 Configuration – System – General

8.3.1 System settings

The system settings apply to all operating modes and can be changed in menu "System".

8.3.2 General system settings

To recognize the flush-mounted WLAN access point in your network, enter an individual, clear name under "Hostname" ("BJE-WLAN-AP“ at the point of delivery). The name must start with a letter and must not contain spaces. Invalid entries are marked in red. The changes are taken over with "Save and apply".

A restart must be carried out after the hostname has been changed. Click "Reboot" and in the window that opens click "Perform reboot".
The restart takes approximately one minute.

8.4 System/Status configuration

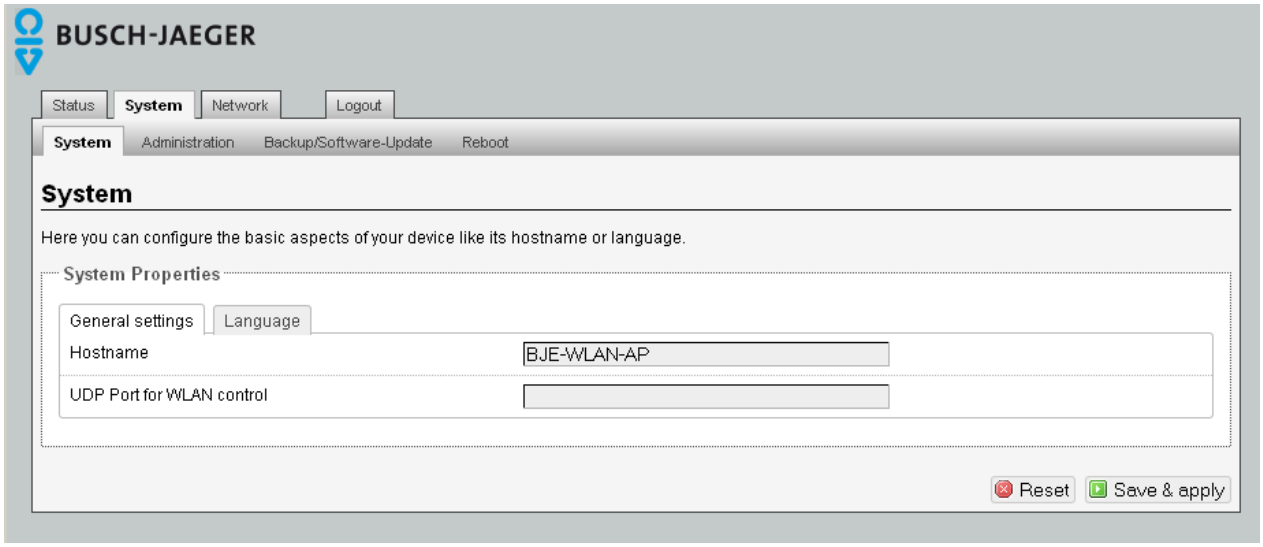

Fig. 13:

8.4.1 System language

Fig. 14:

The control interface can be displayed in German or English.
The settings are taken over with "Save & apply".

8.5 Status configuration
8.5.1 Status information

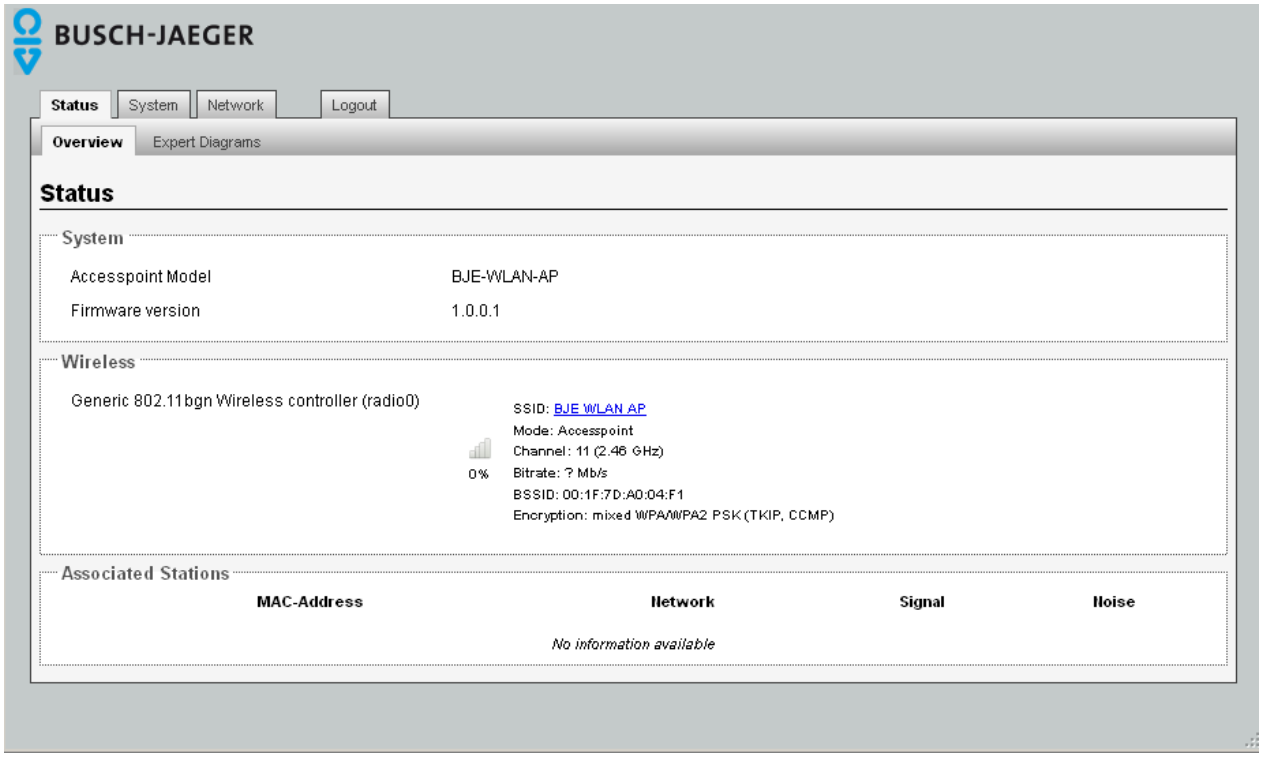

Fig. 15:

Under "Status", the current system values and the devices that are connect to the flush-mounted WLAN access point are displayed. This makes information about the channel and logged-in stations, for example, available for the configuration. If several stations are logged in, the flush-mounted WLAN access point automatically selects the one with the strongest signal. To ensure safe data transmission the received power should not drop below 20%.
Aside from the access point modell, also the Firmware version can be read off here.

8.6 Network configuration

The operating mode and additional aspects of configuration are set in register "Network" under "IP-Configuration" and WLAN".
You can select between the three operating modes Access point (state at delivery), Access point (WDS/Repeater) and Client (WDS) (see chapter "Types of functions" on page 8).

8.6.1 Network IP settings

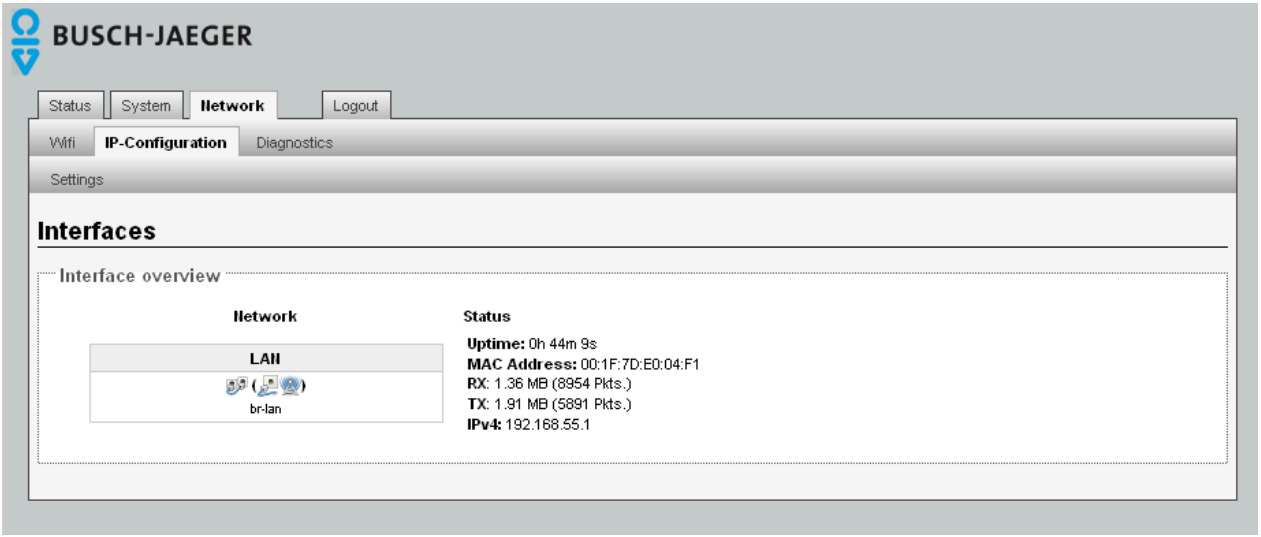

Fig. 16:

In this menu you receive the status information about the LAN settings of your flush-mounted WLAN access point. Displayed are running time, MAC address, sending/receiving rate and the IP address. The icons in the left of the field have the following meaning:

	Interface: network cable
	Interface: front connection
	Interface: radio control

8.6.2 Network - IP settings - Settings

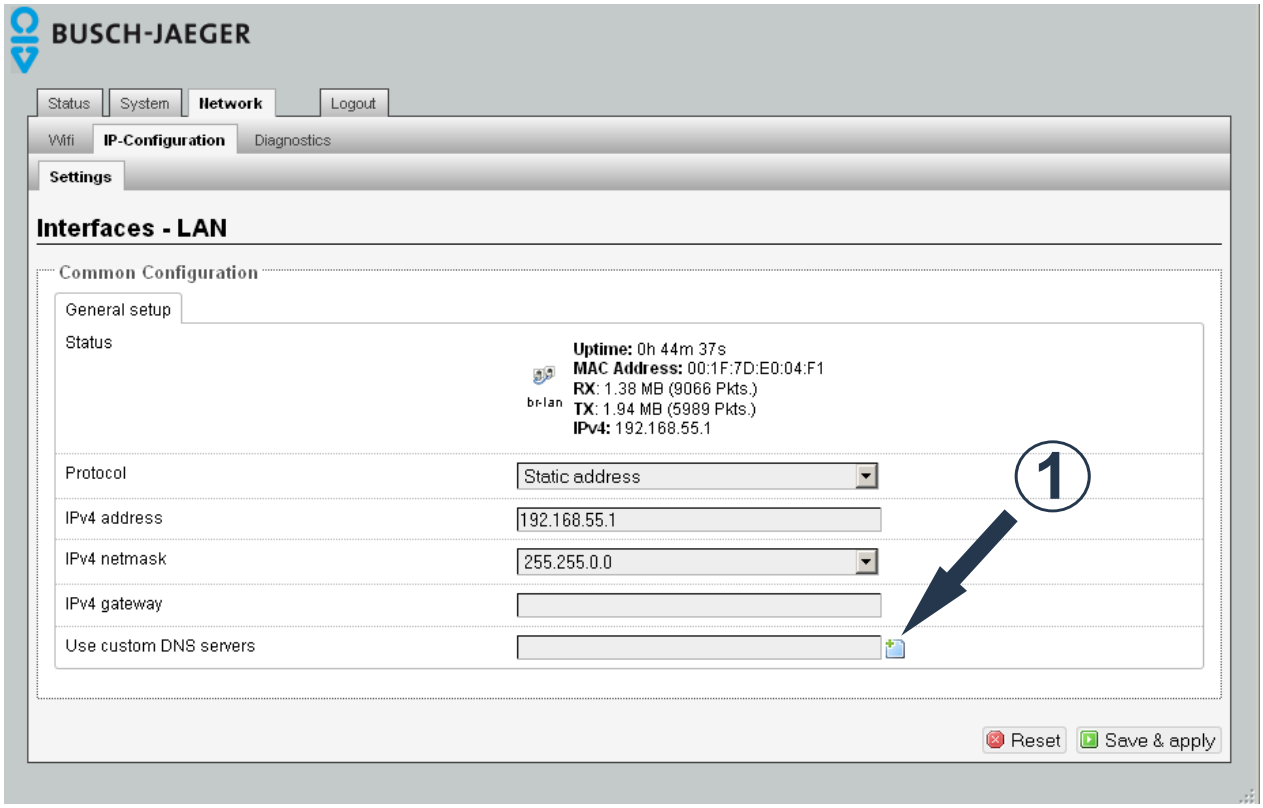

Fig. 17:

Aside from the status information (see chapter "Network IP settings" on page 27), here you can select the protocol (static address or DHCP client), change the IP address and network mask of your flush-mounted WLAN access point, and enter the gateway address and DNS server of your router. By clicking the icon (1), you can add further DNS servers.

8.7 WLAN network

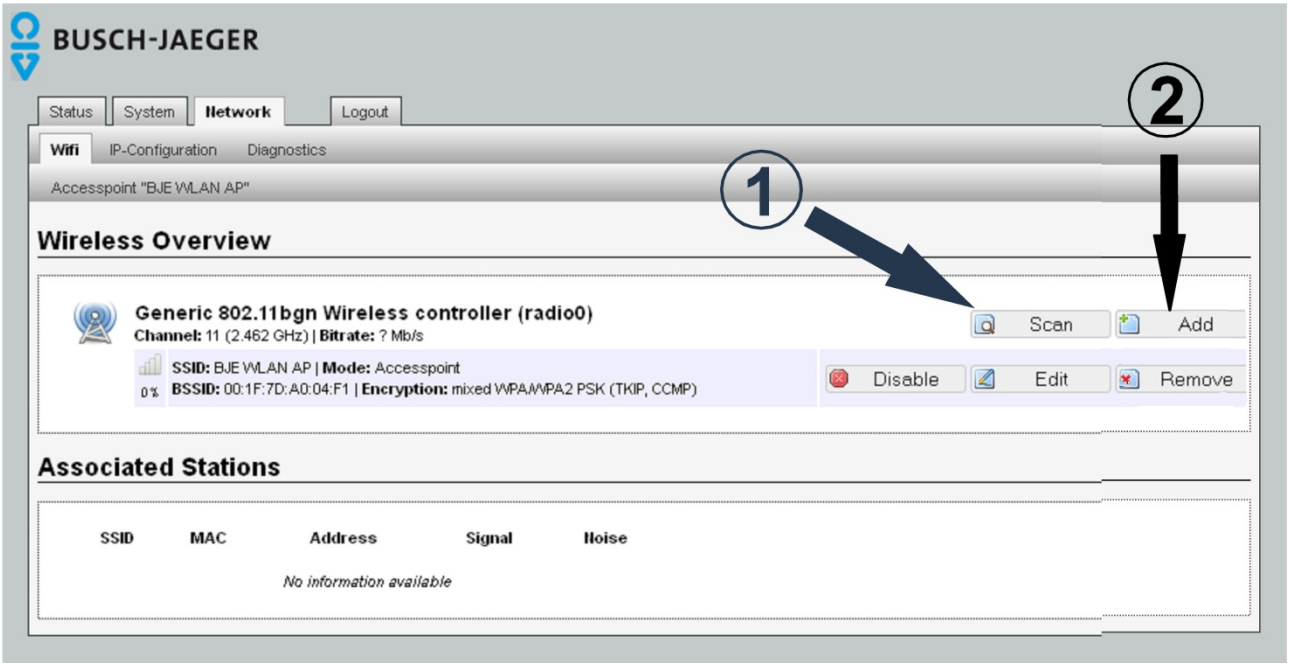

Fig. 18:

In the WLAN status area you get an overview about the WLAN settings of your flush-mounted WLAN access point. Displayed are radio standard, channel, bit rate, SSID, mode, BSSD, encryption, signal strength in percent, logged-in stations with SSID, MAC address, IP address, signal and noise.
Via button "Scan" (1) an overview of adjacent networks is displayed. If there are several networks, a different channel may have to be chosen.

Via button "Add" and "Delete" (2) additional network interfaces can be set up or removed.

Two network interfaces, for example, are required in the types of functions to increase the WLAN transmission range (see chapter "Increase in the range of WLAN (with WDS)" on page 11 and chapter "Increase in the range of WLAN (without WDS)" on page 13).

The settings for the relayd function / repeater mode are described in chapter "Relayd function / Repeater mode" on page 32.

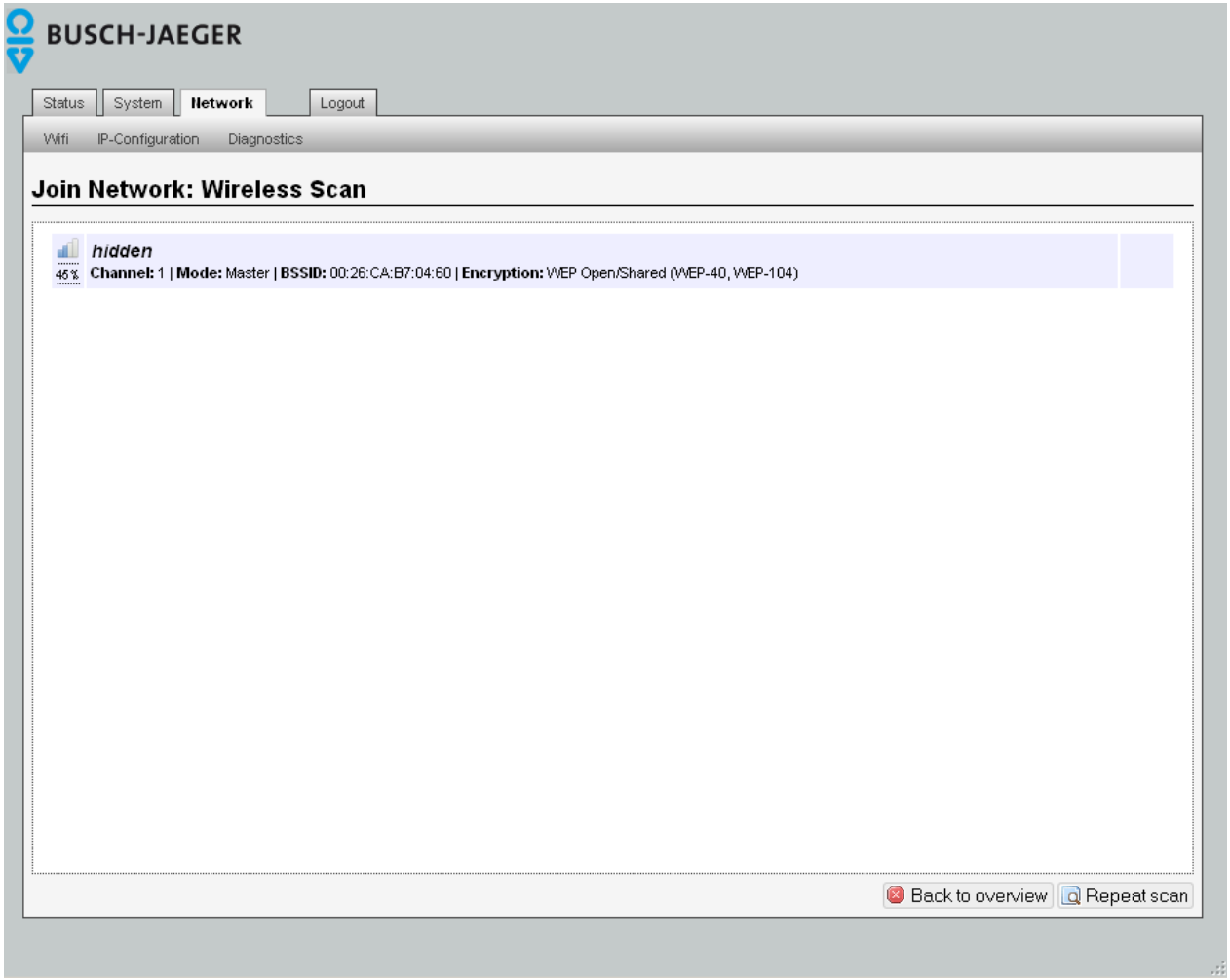
BUSCH-JAEGER
Status
System
Network
Logout
Wifi
IP-Configuration
Diagnostics
Join Network: Wireless Scan
hidden
46 %
Channel: 1 | Mode: Master | BSSID: 00:26:CA:B7:04:60 | Encryption: WEP Open/Shared (WEP-40, WEP-104)
Back to overview
Repeat scan

Fig. 19:

8.7.1 Network - WLAN settings

For WLAN settings a distinction is made between device configuration and interface configuration.

8.7.2 Network – WLAN settings – Device configuration - General settings

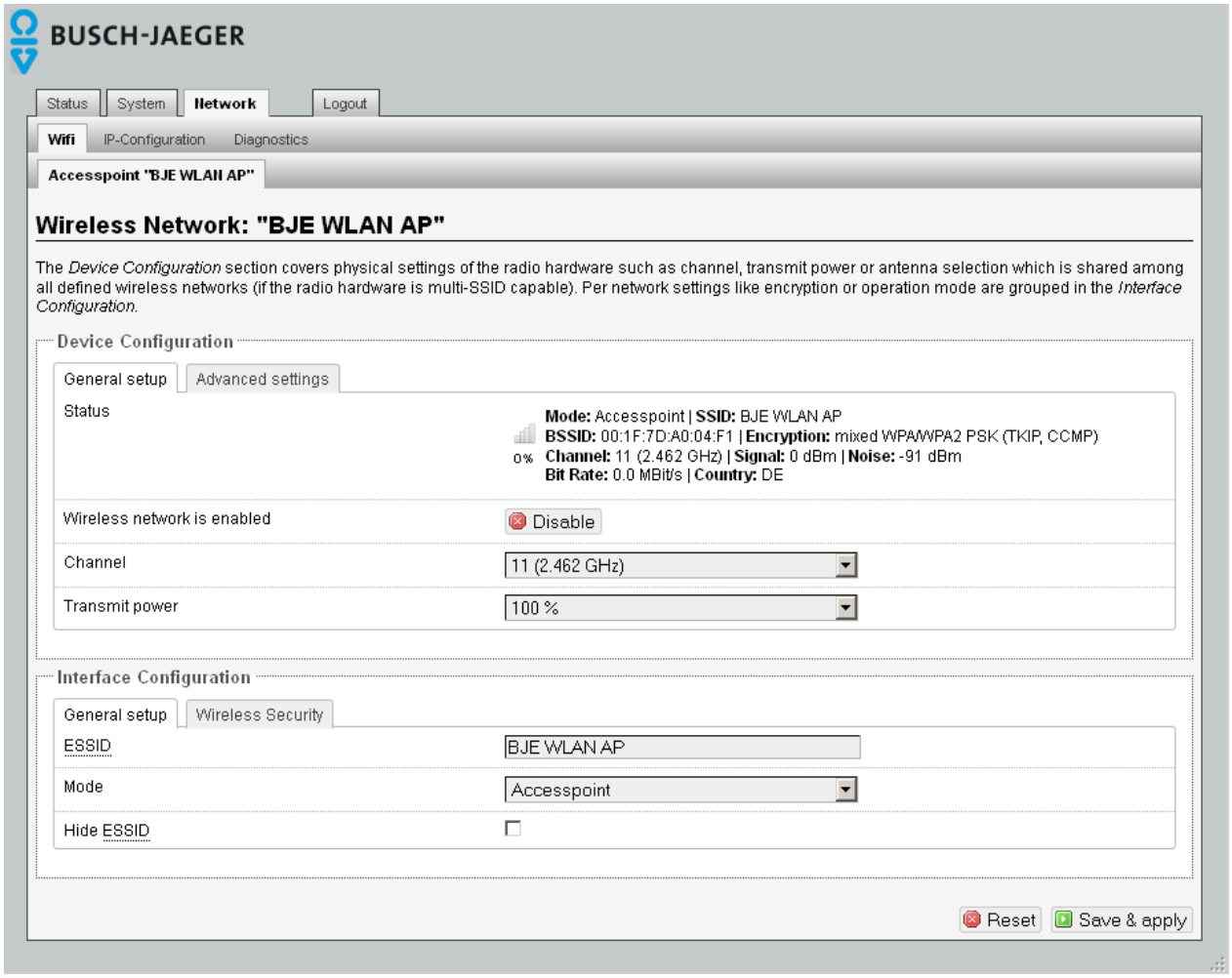

Fig. 20:

The following settings are possible aside from the status display:

- Activating/deactivating WLAN
  - You can deactivate the WLAN if it not required, to prevent radiation and to save energy. The other two interfaces remain available. You can also switchover via UDP (see chapter "Controlling the flush-mounted WLAN access point via UDP" on page 38).
- Channel
  - The frequency range of adjacent channels superimpose on each other. That is why the channel should be selected in such a way that the frequencies of other radio devices in the vicinity do not overlap (e.g. radio microwave devices in the area of channel 9 and 10). In Germany, 13 channels are permitted, in the USA, for example, only 11. In order not to restrict the selection of devices, we recommend the use of only channels 1 to 11.
- Transmitting power
  – By changing the transmitting power the transmission range of the flush-mounted WLAN access point can be adapted. It should be kept as small as possible in the application range.

8.7.3 Network – WLAN settings – Interface configuration - General settings

The settings that are possible in the interface configuration are network-specific:

- ESSID
  - Network name with which the flush-mounted WLAN access point is to be connected
- Mode
  - Four modes are available for selection:
    The operating mode access point,
    Client (WDS),
    Client (Relayd)
    and access point (WDS/Repeater) (see chapter "Types of functions" on page 8)
- Hide ESSID
  - Prevents unauthorized devices from seeing your network

The entries are taken over with "Save & apply".

8.7.4 Network – WLAN settings – Device configuration - General settings

Relayd function / Repeater mode

The relayd function is the basis for the repeater function. Here an available, possibly weak WLAN signal is picked up, boosted and re-transmitted as access point on the mounting position of the flush-mounted WLAN access point. This, for example, allows WLAN connections on an available router to be 'extended' and/or made more operationally reliable. Please note that the maximum data rates
in the types of functions with repeater function are fundamentally halved with each additional repeat. This is due to the general physical principles of the WLAN transmission and not to any special characteristic of the flush-mounted WLAN access point.

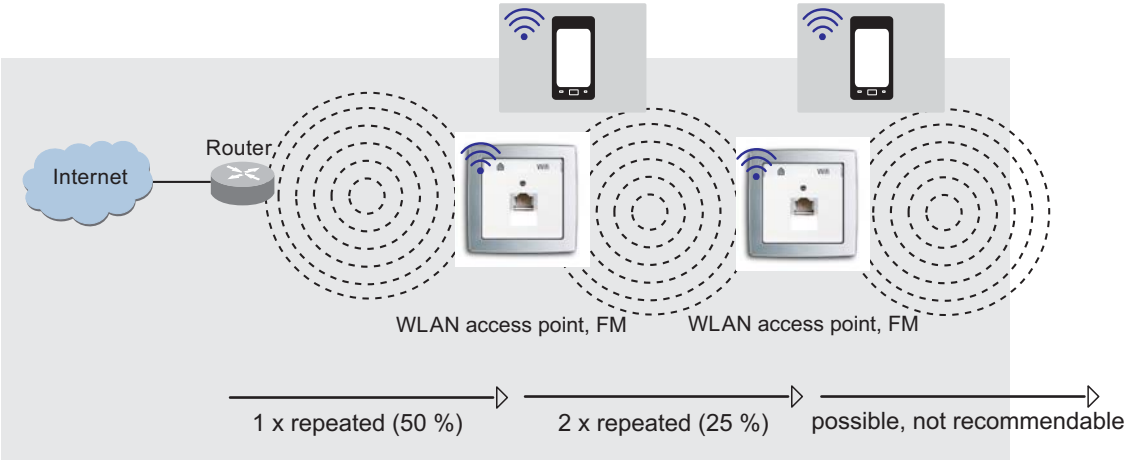

Fig. 21:

The types of functions as repeater and access point require appropriate configuration in the flush-mounted WLAN access point.
Since this involves two different type of WLAN functions, two network interfaces need to be set up (see chapter "WLAN network" on page 29).

The first network interface is configured as "Client (Relayd)". Here the IP address of the Relayd client must lie within the identical address range of the router (or the amplifying device).

The second network interface is parameterized as access point.
Via this network interface during WLAN operation the connection of mobile data transmission units is made, or also additional repeaters that were set up identically in previous processes.

8.7.5 Network – WLAN settings – Device configuration - Extended settings

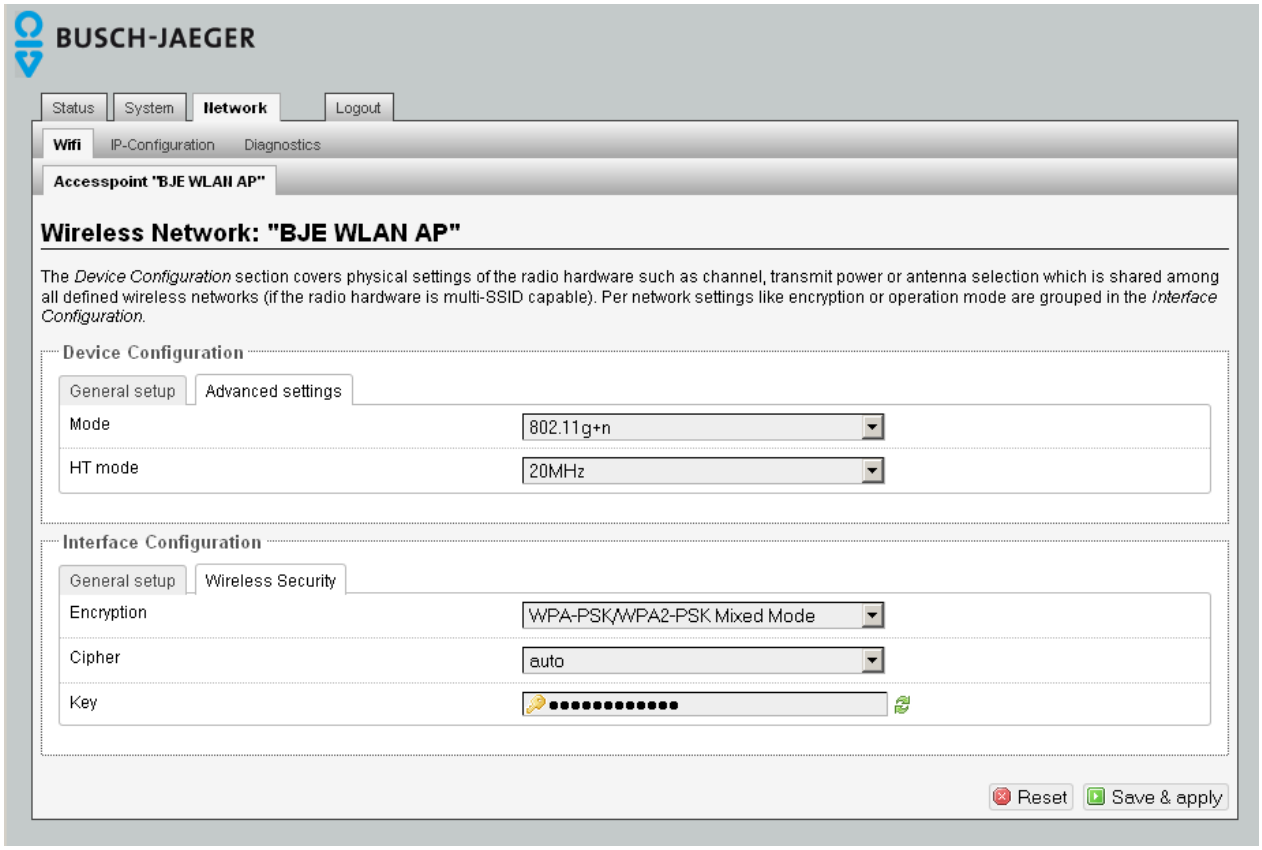

Fig. 22:

Further settings can be made under the device and interface configuration.

- Mode
  At the point of delivery the devices can log themselves in according to standard IEEE-802.11-b/g/n. If you wish to limit the access, you can set special radio standards
- HT mode (only for mode 802.11g+n)
  In n-Standard, HT 20/40 can be selected. Test the band width with the best result.

8.7.6 Interface configuration – WLAN encryption

The WLAN encryption protects the network against attacks from unauthorized users.

- Encryption
  The mode set at the point of delivery is the safest; however, it is not supported by some older devices (avoid WEP!)
- Cipher
  Encryption procedure at state of delivery is "auto"
- Key
  With the assigning of the key you only allow authorized users access to your network.

Ensure that you change the key!

When selecting the key, observe the same criteria as for selecting the password; however, for the encryption procedure such as WPA and WPA2 for WLAN, the password for security reasons should be at least 20 characters long.

The settings made can now be confirmed and taken over with "Save & apply".

8.7.7 Network diagnostics

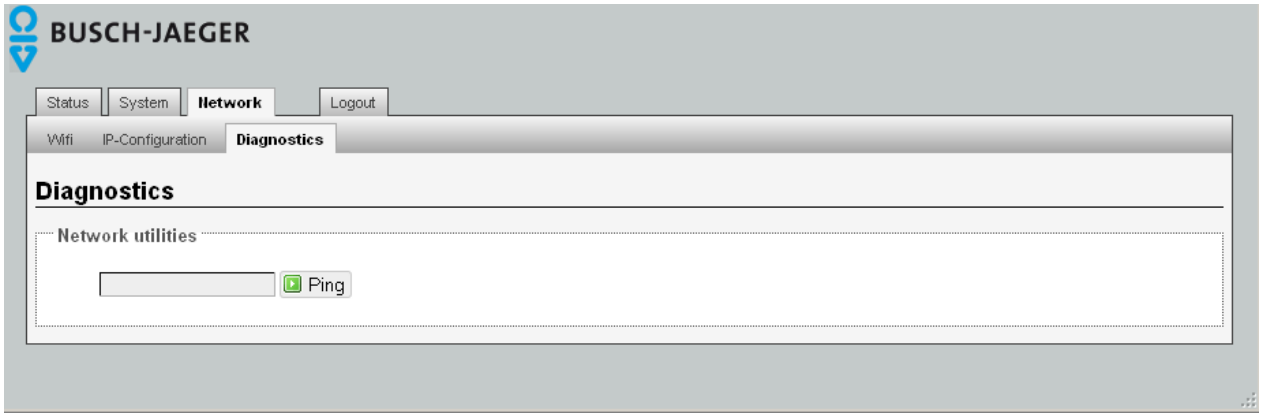

Fig. 23:

With this tool you can test the network and the Internet connections. Enter an Internet address (can be internal or external) and click "Ping". You will then receive information whether the data were sent and the distant end has replied.

8.8 Configuration – System – Backups/Updates

8.8.1 System – Backup/Software-Update

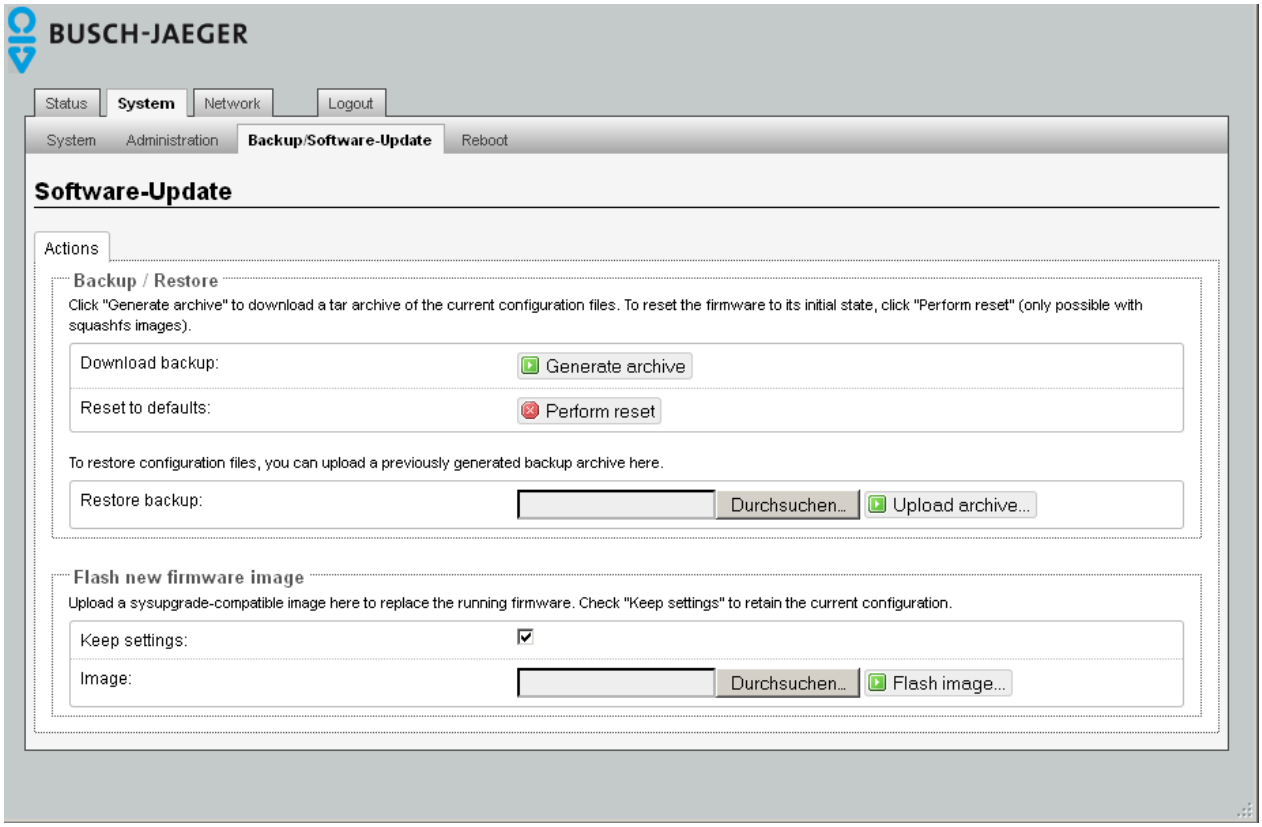

Fig. 24:

As backup you can store your individual settings on a PC or you can carry out a reset to factory settings. Also the new Firmware can be installed.
See also chapter "Backup/Restore" on page 36.
See also chapter "Installing new Firmware" on page 36.

8.8.1.1 Backup/Restore

For the backup, select a folder on your PC in which you save the current settings. Click "Generate archive". Click "Upload archive" to restore the status at the point of delivery. If, for example, you wish to install several flush-mounted WLAN access points with identical configuration, you can save the settings of a device as backup and load them into additional devices.

8.8.1.2 Installing new Firmware

New Firmware can be downloaded from our electronic catalogue (www.busch-jaeger-katalog.de). Proceed as follows::

1. Save the file on your PC.
2. If you wish to keep your current settings, confirm this.
3. Select the stored file.
4. Click "Flash image".

8.8.2 Reboot

Fig. 25:

With a restart you reset the system or take over the settings you made.

8.8.3 Log off

With "Logout" you exit the control interface of the flush-mounted WLAN access point. However, first you must save the settings made. To make further changes, you must log on again with your password.

8.9 Configuration – Expert information

8.9.1 Expert diagram

This menu makes detailed information available about the current data transmissions in the LAN and WLAN area, for use as an analysis tool.

8.9.1.1 LAN1

With this diagram you can check whether a LAN connection exists and the data rates that are transmitted in and out within a period of 3 minutes.

8.9.1.2 WLAN

The WLAN diagram provides information about the quality of transmission with regard to signal, noise and the data rate.

9 Operation

9.1 Controlling the flush-mounted WLAN access point via UDP

The WLAN interface of the device can be activated and deactivated via UDP command. Activate the UDP function by entering the desired port under menu "System". No port is set at the point of delivery.
Then confirm the entry by clicking button "Save & apply".

Restart!
To take over the UDP ports entered, a restart of the flush-mounted WLAN access point is absolutely necessary. Click "Reboot" and in the window that opens click "Perform reboot".
- The restart takes approximately one minute.
– The UDP function is then available.

UDP commands	
Commands	**Meaning**
WLAN ON	Activating the WLAN interface
WLAN OFF	Deactivating the WLAN interface
WLAN ?	Enquiry of status

Observe capitalization and spaces during the entry.
The flush-mounted WLAN access point confirms a sent UDP command with a reply of the current status.

9.2 Meaning of the LEDs

For a detailed fault analysis and for commissioning, also the status of the LEDs that can be seen on the upper module of the flush-mounted WLAN access point when the cover is removed, can be used. They indicate the activity at the respective ports - screw terminal and UAE socket.

No.	Function
1	Link/Act External Ethernet Port (screw terminal)
2	Link/Act Local Ethernet Port (UAE socket)

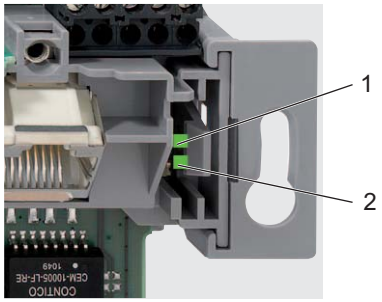

Fig. 26:

9.3 Reset functions

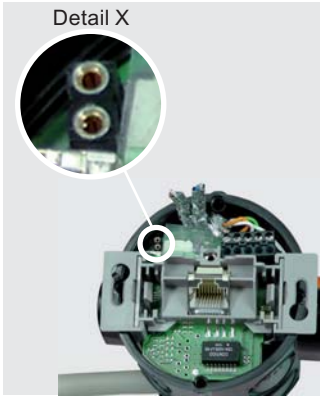

Fig. 27:

9.3.1 Reset to factory settings

- Create a bridge during operation for at least 5 to a maximum of 30 seconds (illustration, Detail X)
- The system starts with the factory settings.

9.3.2 Full reset

If you do not have access to the flush-mounted WLAN access point, you can reset the device fully. After this a firmware must be installed in the flush-mounted WLAN access point.

1. De-energize the flush-mounted WLAN access point.
2. Create a bridge (illustration, Detail X)
3. Reactivate the power supply.
4. Wait 5 seconds.
5 Connect a PC to the flush-mounted WLAN access point via the RJ45 socket.
6 Make the following TCP/IP setting on the network adapter of the PC:

   – Use the static IP address: 192.168.1.2
   – Select "Windows - Start - Execute", and there enter "cmd" and confirm with "OK".
   - Enter "tftp -i 192.168.1.1 put <File name>", replace the <File name> with the file name and path of the current Firmware file (see chapter "Installing new Firmware" on page 36). New Firmware can be downloaded from our electronic catalogue (www.busch-jaeger-katalog.de).

The system sends a feedback signal about the successful data transmission. After a restart the flush-mounted WLAN access point is then again available with the factory settings.

Meaning of the entry:

C:\	Change to the root directory
tftp	Start TFTP client (available in the operating system)
-i	Binary data transmitted
192.168.1.1	Address of the TFTP server in the flush-mounted WLAN access point
put	Transmit data

10 Fault rectification

Cause	Action
LEDs do not light up	
The flush-mounted WLAN access point has no supply voltage.	Switch on the supply voltage.
No connection to the WLAN base station	
The flush-mounted WLAN access point is outside the range of the base station.	Reduce the distance between the devices.
The WLAN function of your flush-mounted WLAN access point has been deactivated.	Activate the WLAN function.
A different WLAN radio network causes interference.	Set a different channel or set the channel on "Auto".
The encryption of your flush-mounted WLAN access point is set on "WEP" or is set on "Unencrypted".	Set the encryption on WPA/WPA2 in the user interface.
The ESSID is set on "hidden".	The ESSID must be set on "visible" for the connection with WEP. Set the ESSID on "visible". After the connection has been established, the ESSID can be set back on "hidden".
A different encryption procedure has been set on the flush-mounted WLAN access point than on the PC.	Set the same encryption procedure on the PC that is set on WLAN access point.
No WLAN connection to the PC	
The WLAN adapter of the PC is not ready.	Check whether the WLAN adapter has been activated; on some devices it must be activated with a switch.
The PC is outside the range of the flush-mounted WLAN access point.	Reduce the distance between the PC and the flush-mounted WLAN access point.
A different encryption procedure has been set on the flush-mounted WLAN access point than on the PC.	Set the same encryption procedure on the PC that is set on WLAN access point.
No access to the devices in the network possible	
A firewall is operating on the devices.	Allow the firewall access to the network.
Wrong address range / wrong network mask	Check whether the addresses have been set correctly.
The flush-mounted WLAN access point cannot be located under the IP address	
The DHCP client has been activated.	Try to locate the device via the WLAN function.
The plain text display for password and key does not function	
You are using Internet Explorer 9.	Go to the compatibility view and remove all activations under Extras/Settings.
The diagram is not displayed.	
You are using Internet Explorer 7 or 8.	Install an SVG plug-in (e.g. from Adobe at http://www.adobe.com/devnet/svg/adobe-svg-viewer-download-area.html).
You are using Internet Explorer 9.	Go to the compatibility view and remove all activations under Extras/Settings.

11 Glossary

Meaning	Abbreviation	Function
Access point	AP	Base station, interface for wireless communication, terminal devices are logged via WLAN into the access point which is connected to the network via cable, comparable with bridges or switches, layer 2 based
Adapter		Connects a cabled communication device with an AP via WLAN
Advanced Encryption Standard	AES	Freely available encryption algorithm with 128, 192 or 256 bit key length and 128 bit block size
Basic Service Set	BSS	The result of synchronization of relevant parameters with several devices
Basic Service Set Identifier	BSSID	Corresponds either to the MAC address of the AP or is randomly generated and clearly describes each BSS
Cipher		Operating mode in which texts that are longer than the block cipher length can be encrypted (e.g. AES)
Client		Connects a cabled communication device with an AP via WLAN, also termed repeater and WLAN adapter
DNS Server		Computer (Server) that carries out name resolution
Domain Name System	DNS	Forms the name resolution, i.e. conversion of a hostname into the relevant IP address
Extended Service Set	ESS	Coupling several WLAN radio cells into a larger one
Extended Service Set Identifier	ESSID	Connecting of several APs to a network requires the same SSID, which is in this case called ESSID
High Throughput	HT mode	Larger band width in HT-40 mode and with it higher speeds are possible. Transmission range is reduced, speed advantage only partly realistic (IEEE-802.11-n devices are required, provided the connection is optimal).
Hostname		Name of AP
Independent Basic Service Set	IBSS	BSS is a closed network without connection to another network
IPv4 address		Fourth version of the Internet Protocol, 32.bit address in four blocks of decimal style with 8 bits each, one value range from 0-255 and separated by a point (xxx.xxx.xxx.xxx)
IPv4 gateway		Links networks of different protocols, specifies the path to the Internet
IPv4 netmask		Division between the network part and address part of the IP address, computers are in the same network if the address part is the same (the bits of the netmask that are equal to "1")
Channel		The frequency range available in the 2.4 GHz range is for better utilization divided into 14 channels, the first 13 being available in Europe.
Local Area Network	LAN	Local network with maximum extension of 500 m, mainly in the home and up to small companies

Mode		Setup and function on page 8
Port		Part of a network address to assign data packets between client and server. With UDP the port number of the service that is to receive the data is also sent
Protocol		Software agreement for data transmission
Repeater		Signal amplifier that increases the transmission range
Roaming		Taking the WLAN connection along from one AP to the next
Key / password		Access protection
Transmitting power		Delivered power of the AP mostly indicated in dBm
Service Set Identifier	SSID	Freely selectable name of a WLAN up to 32 character long, setting in the AP and all connected clients
Temporal Key Integrity Protocol	TKIP	Security protocol in the WLAN or other radio networks is based on the IEEE-802.11 standard
User Datagram Protocol	UDP	Simple, wireless network protocol for transmitting data. Port are used for assigning the data to the correct application.
Encryption		Serves for the security of data transmission
Wi-Fi Protected Access	WPA	WLAN encryption algorithm
	WPA2	Successor of WPA and based on AES according to WLAN standards IEEE 802.11 a,b,g,n
Wired Equivalent Privacy	WEP	WLAN encryption algorithm
Wireless Distribution System	WDS	Procedure for addressing data frames, setup of a radio network with several APs, WDS both with a WLAN interface (Single-Radio-WDS, connection to the AP and client), as well as with several Dual-Radio-WDS, one interface to the AP and another one to the client, implemented on the AP, differentiation in bridging (2 WLAN bridges connected) and repeating mode (several APs connected via WDS).
Wireless Local Area Network	WLAN	Like WLAN, but wireless

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